APPENDIX A

Therefore, we claim:

1. (Once amended) A shape memory alloy (SMA) switch comprising:

a substrate;

a continuous SMA element attached to said substrate at first and second locations and having a first portion and a second portion, said first portion contracting to place said SMA element in a first conformation upon being heated above a predetermined temperature and said second portion contracting to place said SMA element in a second conformation upon being heated above said predetermined temperature; and

a cursor attached to said SMA element at a location substantially intermediate said first and said second portions to reciprocate between a first position when said SMA element is in said first conformation and a second position when said SMA element is in said second conformation; and

means for separately applying sufficient heat to said first and said second portions of said SMA element to reciprocate said cursor between said first and said second positions wherein said means for separately applying heat comprises a first electrical circuit that includes said first portion of said SMA element and a second electrical circuit that includes said second portion of said SMA element, said first and second circuits sharing a common ground fixedly attached to a mounting surface upon which said substrate is mounted.

2. The SMA switch of claim 1 further comprising a first contact arm situated adjacent said cursor, said first contact arm having an open position and a closed position, said cursor being in sliding contact with said first contact arm to move said first contact arm from said open position to said closed position as said cursor moves from said second position to said first position.

3. The SMA switch of claim 2 wherein said first contact arm is electrically conductive.

4. (Cancelled)

5. The SMA switch of claim 2 further comprising a second contact arm and an electrically conductive short bar disposed on said cursor to create first and second electrical contact points, said first and second contact arms being biased to contact said cursor such that, when said cursor is in said first position, said first and said second contact arms are electrically coupled to each other via said short bar to close said SMA switch, said bias of said first and said second contact arms providing a force to maintain said cursor in said first position.

6. The SMA switch of claim 2 wherein said cursor has two lateral side surfaces, one of said lateral side surfaces having a first cut-away portion dimensioned to interlock with said first contact arm and the other of said lateral side surfaces having a second cut-away portion to interlock with a second contact arm such that said interlocking between said lateral side surfaces and said first and second contact arms maintains movement of said

cursor substantially within a single plane as said cursor moves between said first and second positions.

7. The SMA switch of claim 5 wherein said first and second electrical contact points are recessed within said cursor to receive said first and said second contact arms.

8. The SMA switch of claim 2 wherein said first contact arm is situated within a travel path of said cursor such that said first contact arm is displaced by said cursor as said cursor moves from said second to said first position, said displacement bringing said first contact arm into contact with a second contact arm to place said first contact arm into said closed position.

9. The bistable SMA switch of claim 8 wherein said cursor has a lateral surface in contact with said first contact arm, said lateral surface including a projection located at a position on said lateral surface such that as said cursor moves from said second position to said first position, said first contact arm first encounters a first slope of said projection that displaces said first contact arm into abutting engagement with said second contact arm and as said cursor continues toward said first position, said first contact arm encounters a second slope of said projection that permits displacement of said first contact arm in a direction opposite to said displacement caused by said first slope as said cursor moves from said second to said first position.

10. The SMA switch of claim of 9 wherein said second contact arm is biased to exert a force on said first contact arm that has a component which is substantially perpendicular to a direction of travel of said cursor between said first and second positions, said component of said force acting against said projection to provide resistance against movement of said cursor from said first to said second position.

11. (Cancelled)

12. (Once amended) The switch of claim 1 further comprising a spring component connected to said SMA element to maintain an electrical connection between said SMA element and said common electrical ground while permitting said SMA element to alternate between said first and second conformations.

13. (Once amended) The switch of claim 1 further comprising a brush element in sliding contact with said common electrical ground, said brush element being connected to said SMA element to maintain an electrical connection between said SMA element and said common electrical ground while permitting said SMA element to alternate between said first and second conformations.

14. (Once amended) The switch of claim 1 wherein said common ground comprises a wire bond electrically connecting said SMA element to said mounting surface via said cursor.

15.(Once amended) A bistable shape memory alloy (SMA) switch comprising:

a substrate;

a transducer connected to said substrate comprising a single continuous SMA element having first and second conformations and including:

a) a first heating unit coupled to a first segment of said SMA element to heat said first segment above a predetermined temperature causing contraction of said first segment so that said SMA element assumes said first conformation; and

b) a second heating unit coupled to a second segment of said SMA element to heat said second segment above said predetermined temperature causing contraction of said second segment so that said SMA element assumes said second conformation, wherein said first and said second heating units respectively comprise a first electrical circuit and a second electrical circuit, said first and said second electrical circuits sharing a common node on said SMA element that includes an electrical ground fixedly attached to a mounting surface upon which said substrate is mounted and a spring component extending from said electrical ground to said SMA element to maintain electrical connectivity between said SMA element and said electrical ground while permitting movement of said SMA element between said first and said second conformations;

a cursor coupled to said SMA element to reciprocate between first and second positions as said SMA element alternates between said first and said second conformations; and

a first contact arm in sliding contact with said cursor to move from an open position to a closed position as said cursor moves from said second to said first position.

16-18. (Cancelled)

19. The SMA switch of claim 15 wherein said cursor includes a short bar having first and second contact points, said bistable SMA switch further comprising a second contact arm wherein said first and said second contact arms are both biased to contact said cursor such that, when said cursor is in said first position, said first and said second contact arms are electrically coupled via said short bar, said first contact arm is mechanically coupled to said first contact point, and said second contact arms is mechanically coupled to said second contact point.

20. The SMA switch of claim 19 wherein said first and said second contact points are recessed into said cursor.

21. The SMA switch of claim 15 further comprising a second contact arm, said first contact arm being situated within a travel path of said cursor such that said first contact arm is moved into said closed position to contact said second contact arm as said cursor moves from said second to said first position.

22. A shape memory alloy (SMA) switch comprising having open and closed states comprising:

a substrate;

a single continuous SMA element connected to said substrate at first and second locations and having first and second sections, said first section contracting to place said SMA element into a first conformation upon being heated above a predetermined temperature and said second section contracting to place said SMA element into a second conformation upon being heated above said predetermined temperature;

a cursor coupled to said SMA element substantially between said first and said second sections to reciprocate between first and second positions as said SMA element alternates between said first and said second conformations;

a first contact arm biased toward said cursor for sliding contact with said cursor as said cursor moves from said first to said second position, said first contact arm being positioned within a travel path of said cursor so that as said cursor moves from said second to said first position, said first contact arm becomes electrically coupled to a second contact arm to trigger said closed state of said SMA switch; and

means for separately and independently heating said first and said second sections of said SMA element.

23. The SMA switch of claim 22 wherein a bias of one of said first and said second contact arms toward said cursor exerts a force on said cursor to maintain said closed state of said switch when said cursor is in said first position.

24. The SMA switch of claim 22 wherein said heating means includes a first electrical circuit that includes said first section of said SMA element and a second electrical circuit that includes said second section of said SMA element.

25. The switch of claim 24 wherein said first and said second electrical circuits share a common node comprising an electrical ground fixedly attached to a mounting surface upon which said substrate is mounted and a spring component connected to said SMA element to provide electrical connectivity between said SMA element and said common ground while permitting movement of said cursor between said first and said second positions.

26. The SMA switch of claim 24 wherein said first and said second electrical circuits include a common node comprising an electrical ground fixedly attached to a mounting surface upon which said substrate is mounted and a brush element in sliding contact with said electrical ground and fixedly attached to said SMA element to provide electrical connectivity between said SMA element and said common ground while permitting movement of said cursor between said first and said second positions

27. The SMA switch of claim 22 further comprising an electrically conductive short bar disposed on said cursor to create first and second electrical contact points, said first and second contact arms being positioned with respect to said cursor such that, when said cursor is in said first position, said first and said second contact arms are electrically coupled to each other via said short bar to close said SMA switch.

28. The SMA switch of claim 22 wherein said cursor has two lateral side surfaces, one of said lateral side surfaces having a first cut-away portion dimensioned to interlock with said first contact arm and the other of said lateral side surfaces having a second cut-away portion to interlock with said second contact arm such that said interlocking between said lateral side surfaces and said first and second contact arms maintains movement of said cursor substantially within a single plane as said cursor moves between said first and second positions.

29. The SMA switch of claim 22 wherein said first contact arm is situated within a travel path of said cursor such that said first contact arm is displaced by said cursor as said cursor moves from said second to said first position, said displacement bringing said first contact arm into contact with said second contact arm.